

1. A dual band mixer, comprising:

a common node for at least one radio frequency input and an intermediate frequency output;

a first transistor having a gate coupled to a first local oscillator input and a drain

5 coupled to the common node; and

a second transistor having a gate coupled to a second local oscillator input and a drain coupled to the common node.

2. The dual band mixer of claim 1, wherein the first transistor has a source

10 coupled to ground and the second transistor has a source coupled to ground.

3. The dual band mixer of claim 1, wherein the first and second transistors are field effect transistors.

15 4. The dual band mixer of claim 3, wherein the first and second transistors are depletion-type transistors.

5. The dual band mixer of claim 1, further comprising circuitry to turn off the second transistor when a first local oscillator signal is applied to the gate of the first transistor  
20 and to turn off the first transistor when a second local oscillator signal is applied to the gate of the second transistor.

6. The dual band mixer of claim 5, wherein the circuitry includes a first network associated with the first transistor to generate a first negative voltage at a first node when the first local oscillator signal is applied to the gate of the first transistor and a second network associated with the second transistor to generate a second negative voltage at a second node when the second local oscillator signal is applied to the gate of the second transistor.

7. The dual band mixer of claim 6, wherein the first network includes a first

30 diode connected between the gate of the first transistor and the first node, and a first

capacitor and a second diode connected in parallel between the source of the first transistor and the first node.

8. The dual band mixer of claim 7, wherein the second network includes a third diode connected between the gate of the second transistor and the second node, and a second capacitor and a fourth diode connected in parallel between the source of the second transistor and the second node.

9. The dual band mixer of claim 6, further comprising a common line coupling the first and second nodes.

10. The dual band mixer of claim 5, wherein the circuitry does not require an external voltage source.

15 11. The dual band mixer of claim 1, further comprising a plurality of radio frequency inputs and a switch to direct one of the plurality of radio frequency inputs to the common node.

12. A method of mixing in a dual band mixer, comprising:  
20 driving a gate of a first transistor with a first local oscillator input;  
driving a gate of a second transistor with a second local oscillator input;  
providing a radio frequency input to a common node that is coupled to drains of the first and second transistors; and  
sensing an intermediate frequency output from the common node.

25 13. A dual band mixer, comprising:  
a first transistor to mix a first local oscillator input signal with a first radio frequency signal;  
a second transistor to mix a second local oscillator input signal with a second radio  
30 frequency signal; and

interconnection circuitry to turn off the second transistor when the first local oscillator input signal is applied to the first transistor and to turn off the first transistor when the second local oscillator input signal is applied to the second transistor.

5        14.      The dual band mixer of claim 13, further comprising a common node for at least one of the first and second radio frequency input signals and an intermediate frequency output, and drains of the first and second transistors are coupled to the common node.

10       15.      The dual band mixer of claim 13, wherein the first and second transistors are field effect transistors.

16.      The dual band mixer of claim 15, wherein the first and second transistors are depletion-type transistors.

15       17.      The dual band mixer of claim 13, wherein the interconnection circuitry includes a first network associated with the first transistor to generate a first negative voltage at a first node when the first local oscillator signal is applied to the gate of the first transistor and a second network associated with the second transistor to generate a second negative voltage at a second node when the second local oscillator signal is applied to the gate of the second transistor.

20       18.      The dual band mixer of claim 17, wherein the first network includes a first diode connected between the gate of the first transistor and the first node, and a first capacitor and a second diode connected in parallel between the source of the first transistor and the first node.

25       19.      The dual band mixer of claim 18, wherein the second network includes a third diode connected between the gate of the second transistor and the second node, and a second capacitor and a fourth diode connected in parallel between the source of the second transistor and the second node.

20. The dual band mixer of claim 17, further comprising a common line coupling the first and second nodes.

21. A dual band mixer, comprising:

5 a plurality of transistors to mix a plurality of local oscillation input signals with a plurality of radio frequency signals; and

interconnection circuitry coupling the plurality of transistors configured to turn off transistors other than one transistor at which a local oscillation input signal is received.

10 22. A method of mixing in a dual band mixer, comprising:

mixing a first local oscillator input signal with a first radio frequency signal at a first transistor;

mixing a second local oscillator input signal with a second radio frequency signal at a second transistor; and

15 turning off the second transistor when the first local oscillator input signal is applied to the first transistor and turning off the first transistor when the second local oscillator input signal is applied to the second transistor.